

CLAIMS

1. (Original) A valve including a valve housing providing a chamber accommodating at least part of a valve member, said chamber forming at least part of a first or high pressure side of said valve, a valve port leading from said chamber to a second or low-pressure side of said valve, a valve seat around the valve port, said valve member having a seating surface co-operating with the valve seat and the valve member being displaceable, along an axis passing through said port, respectively (a) in a first direction, to move said seating surface into said chamber and away from said valve seat and (b) in a second, opposite direction, to move said seating surface towards said valve seat, biasing means being provided biasing said valve member in said second direction towards its closed position, wherein the valve housing affords, on the low pressure side of the valve, a shroud or wall extending transversely with respect to the valve axis and spaced from said valve port so as to deflect any gas proceeding from said valve port in a direction parallel with said valve axis, the valve housing defining with said shroud or transverse wall one or more transverse passages leading to opening at the sides of the valve housing, for the passage of gas issuing from said valve port.
2. (Original) A valve as claimed in Claim 1 wherein said transverse wall or shroud has a central aperture through which extends, as a sliding fit, a central axial extension of said valve member, whereby the valve member is reliably guided for said axial movement.
3. (Currently Amended) A valve as claimed in Claim 1 ~~or Claim 2~~ wherein the periphery of the valve housing is undercut in the region behind the transverse wall, (that is to say the region which has a position, along said axis, closer to said valve seat than said transverse wall), in such a way that said undercut region, from a position adjacent said transverse wall which is closer to said axis than the periphery of said transverse wall, becomes gradually increasingly spaced from said axis with distance, measured parallel with said axis, away from said transverse wall, so that over said undercut region, the peripheral surface of the valve body is inclined with respect to said axis, and wherein the or each said opening or openings at the side of the valve body opens onto said inclined peripheral surface.
4. (Original) A valve including a valve housing providing a chamber accommodating at least part of a valve member, said chamber forming at least part of a first or high pressure side of said valve, a valve port leading from said chamber to a second or low-pressure side of

said valve, a valve seat around the valve port, said valve member having a seating surface cooperating with the valve seat and the valve member being displaceable, along an axis passing through said port, respectively (a) in a first direction, to move said seating surface into said chamber and away from said valve seat and (b) in a second, opposite direction, to move said seating surface towards said valve seat, the valve member having a bore extending axially from the high pressure end thereof and forming a cylinder sealingly slidable, in said first and second directions, on a piston fixed within said valve housing, to define therewith a further chamber, biasing means being provided biasing said valve member in said second direction towards its closed position, said further chamber in either case communicating with the low pressure side of the valve, whereby the effective area of said valve member acted on by the fluid pressure difference between said first and second sides of said valve is substantially reduced as compared with the area encompassed by said valve seat, and wherein said piston has a base part or a supporting insert providing an outer periphery received in an internal recess or groove provided around a bore which extends axially into the valve housing from a high pressure end thereof and which bore at least partially defines said chamber accommodating the valve member, said internal recess or groove being disposed at a location remote from said valve seat, the valve housing having one or more longitudinal slits therethrough extending from the high pressure end of the valve housing, (i.e. the end remote from said valve seat) adjacent said internal groove or recess and extending through the location of said internal groove or recess, the material of the valve housing being sufficiently resilient to allow the wall of the valve housing to be flexed outwardly sufficiently to allow said base part or insert to pass within said bore in the valve housing from said high pressure end thereof to the axial position of said internal groove or recess and to allow the wall of the valve housing thereafter to spring back around said base part or insert to locate said base part or insert in said internal groove or recess.

5. (Original) A valve including a valve housing providing a chamber accommodating at least part of a valve member, said chamber forming at least part of a first or high pressure side of said valve, a valve port leading from said chamber to a second or low-pressure side of said valve, a valve seat around the valve port, said valve member having a seating surface cooperating with the valve seat and the valve member being displaceable, along an axis passing through said port, respectively (a) in a first direction, to move said seating surface into said chamber and away from said valve seat and (b) in a second, opposite direction, to move said seating surface towards said valve seat, the valve member having a bore extending axially

from the high pressure end thereof and forming a cylinder sealingly slidable, in said first and second directions, on a piston fixed within said valve housing, to define therewith a further chamber, biasing means being provided biasing said valve member in said second direction towards its closed position, said further chamber in either case communicating with the low pressure side of the valve, whereby the effective area of said valve member acted on by the fluid pressure difference between said first and second sides of said valve is substantially reduced as compared with the area encompassed by said valve seat, and wherein said piston has a base part or supporting insert providing an outer periphery received in an internal recess or groove provided around a bore which extends axially into the valve housing from a high pressure end thereof and which bore at least partially defines said chamber accommodating the valve member, said internal recess or groove being disposed at a location remote from said valve seat, wherein the base part or supporting insert is designed for resilient inward flexing to allow it to be inserted in the bore in the valve housing from said high pressure end thereof to spring into said groove when the base part or insert is at the longitudinal position of said internal groove or recess, thereby to retain said piston in place.

6. (Currently Amended) A valve as claimed in Claim 4 ~~or claim 5~~ wherein the lower edge, (high pressure edge) of the bore in the valve housing is internally chamfered and/or wherein the outer edge of said base part is externally chamfered, to facilitate insertion of the base part or insert into the bore in the valve housing from said lower end (high pressure end) of the valve housing.

7. (Original) A sealing arrangement comprising a body having a bore, a seal for sealing said bore with respect to a piston or the like member disposed centrally within the bore and providing a larger diameter portion engaging, or closer to, the wall of said bore and a smaller diameter portion on a higher pressure side of said larger diameter portion, said seal comprising a resilient material which is generally U-shaped in half-section along the axis of said bore, the seal providing a base part abutting a shoulder extending from the periphery of said larger diameter part to the periphery of said smaller diameter part, said base providing the base of the U-section, the seal including an inner sleeve, defining an inner limb of said U-section and extending around said smaller diameter part, and extending away from said base to a free edge, the seal further including an outer sleeve extending from said base part along said bore to a free edge of the outer sleeve, said outer sleeve defining the other limb of said U-section, and wherein said outer sleeve, in an unstressed state of said seal, (and thus in an

un-installed state) diverges slightly from the axis of the seal, with increasing distance from said base.

8. (Original) A sealing arrangement according to Claim 7 wherein the inner sleeve, in an un-stressed state of the seal, converges slightly towards said central axis of the seal with increasing distance from said annular base.

9. (Currently Amended) A sealing arrangement according to Claim 7 ~~or Claim 8~~ wherein the outer sleeve tapers in radial thickness towards said free edge thereof.

10. (Currently Amended) A sealing arrangement according to ~~any of~~ claims 7 ~~to 9~~ wherein the outer sleeve, in semi-axial section, is curved outwardly towards said free edge.

11. (Currently Amended) A sealing arrangement according to ~~any of~~ Claims 7 ~~to 10~~ wherein the thickness of the base part - measured axially - is greater than twice the greatest radial thickness of the outer sleeve.

12. (Currently Amended) A sealing arrangement according to ~~any of~~ Claims 7 ~~to 11~~ wherein the thickness of the base part - measured axially, is greater than twice the greatest thickness of the inner sleeve.

13. (Currently Amended) A sealing arrangement according to ~~any of~~ claims 7 ~~to 12~~ wherein the seal is of PTFE.

14. (Currently Amended) A sealing arrangement according to ~~any of~~ claims 7 ~~to 12~~ wherein the seal is of polyethylene.

15. (Original) A sealing arrangement according to Claim 14 wherein the seal is formed by injection moulding followed by gamma radiation.

16. (Cancelled)

17. (New) A valve as claimed in Claim 2 wherein the periphery of the valve housing is undercut in the region behind the transverse wall, (that is to say the region which has a

position, along said axis, closer to said valve seat than said transverse wall), in such a way that said undercut region, from a position adjacent said transverse wall which is closer to said axis than the periphery of said transverse wall, becomes gradually increasingly spaced from said axis with distance, measured parallel with said axis, away from said transverse wall, so that over said undercut region, the peripheral surface of the valve body is inclined with respect to said axis, and wherein the or each said opening or openings at the side of the valve body opens onto said inclined peripheral surface.

18. (New) A valve as claimed in Claim 5 wherein the lower edge, (high pressure edge) of the bore in the valve housing is internally chamfered and/or wherein the outer edge of said base part is externally chamfered, to facilitate insertion of the base part or insert into the bore in the valve housing from said lower end (high pressure end) of the valve housing.

19. (New) A sealing arrangement according to Claim 8 wherein the outer sleeve tapers in radial thickness towards said free edge thereof.

20. (New) A sealing arrangement according to Claim 8 wherein the outer sleeve, in semi-axial section, is curved outwardly towards said free edge.

21. (New) A sealing arrangement according to Claim 9 wherein the outer sleeve, in semi-axial section, is curved outwardly towards said free edge.

22. (New) A sealing arrangement according to Claim 8 wherein the thickness of the base part - measured axially - is greater than twice the greatest radial thickness of the outer sleeve.

23. (New) A sealing arrangement according to Claim 9 wherein the thickness of the base part - measured axially - is greater than twice the greatest radial thickness of the outer sleeve.

24. (New) A sealing arrangement according to Claims 10 wherein the thickness of the base part - measured axially - is greater than twice the greatest radial thickness of the outer sleeve.

25. (New) A sealing arrangement according to Claim 8 wherein the thickness of the base part - measured axially, is greater than twice the greatest thickness of the inner sleeve.

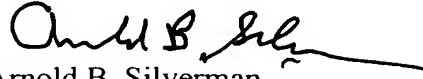
26. (New) A sealing arrangement according to Claim 11 wherein the thickness of the base part - measured axially, is greater than twice the greatest thickness of the inner sleeve.
27. (New) A sealing arrangement according to Claims 8 wherein the seal is of PTFE.
28. (New) A sealing arrangement according to Claim 12 wherein the seal is of PTFE.
29. (New) A sealing arrangement according to Claim 9 wherein the seal is of polyethylene.
30. (New) A sealing arrangement according to Claim 12 wherein the seal is of polyethylene.
31. (New) The valve of Claim 4, including: a sealing arrangement comprising a body having a bore, a seal for sealing said bore with respect to a piston or the like member disposed centrally within the bore and providing a larger diameter portion engaging, or closer to, the wall of said bore and a smaller diameter portion on a higher pressure side of said larger diameter portion, said seal comprising a resilient material which is generally U-shaped in half-section along the axis of said bore, the seal providing a base part abutting a shoulder extending from the periphery of said larger diameter part to the periphery of said smaller diameter part, said base providing the base of the U-section, the seal including an inner sleeve, defining an inner limb of said U-section and extending around said smaller diameter part, and extending away from said base to a free edge, the seal further including an outer sleeve extending from said base part along said bore to a free edge of the outer sleeve, said outer sleeve defining the other limb of said U-section, and wherein said outer sleeve, in an unstressed state of said seal, (and thus in an un-installed state) diverges slightly from the axis of the seal, with increasing distance from said base.
32. (New) The valve of Claim 5, including: a sealing arrangement comprising a body having a bore, a seal for sealing said bore with respect to a piston or the like member disposed centrally within the bore and providing a larger diameter portion engaging, or closer to, the wall of said bore and a smaller diameter portion on a higher pressure side of said larger diameter portion, said seal comprising a resilient material which is generally U-shaped

in half-section along the axis of said bore, the seal providing a base part abutting a shoulder extending from the periphery of said larger diameter part to the periphery of said smaller diameter part, said base providing the base of the U-section, the seal including an inner sleeve, defining an inner limb of said U-section and extending around said smaller diameter part, and extending away from said base to a free edge, the seal further including an outer sleeve extending from said base part along said bore to a free edge of the outer sleeve, said outer sleeve defining the other limb of said U-section, and wherein said outer sleeve, in an unstressed state of said seal, (and thus in an un-installed state) diverges slightly from the axis of the seal, with increasing distance from said base..

33. (New) The valve of Claim 4, including: a sealing arrangement wherein the inner sleeve, in an un-stressed state of the seal, converges slightly towards said central axis of the seal with increasing distance from said annular base.

34. (New) The valve of Claim 5, including: a sealing arrangement wherein the inner sleeve, in an un-stressed state of the seal, converges slightly towards said central axis of the seal with increasing distance from said annular base.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Arnold B. Silverman", with a long, sweeping horizontal line extending to the right.

Arnold B. Silverman
Registration Number 22,614
Attorney for Applicant

Telephone: 412-566-6965